BRANFORD HARBOR

CONNECTICUT

REVIEW REPORT

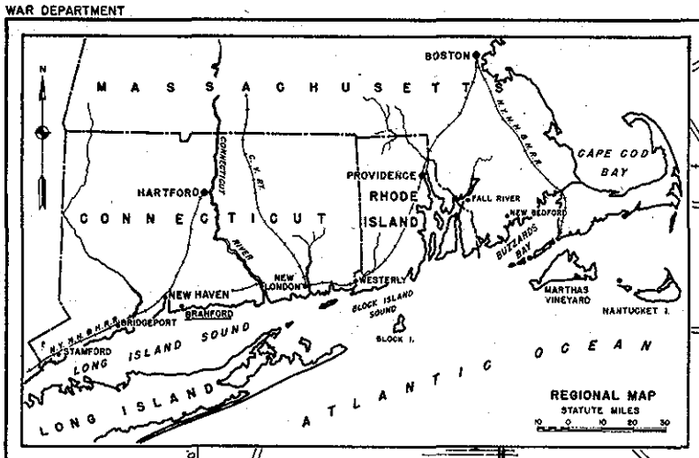
WAR DEPARTMENT, CORPS OF ENGINEERS, U. S. ARMY
U. S. ENGINEER OFFICE, PROVIDENCE, RHODE ISLAND

20

31 MAY 1946

WAR DEPARTMENT

CORPS OF ENGINEERS, U. S. ARMY



B R A N F O R D

TO BOSTON

N.Y., N.H. & H.R.R.

TO NEW YORK

Malleable Iron Fittings Co.

72°-50'

41°-16'

IMPROVEMENTS DESIRED BUT NOT RECOMMENDED

CHANNEL, 12 FT. DEEP M.L.W.

ANCHORAGE BASIN, 6 FT. DEEP M.L.W.

LINDSEY COVE

PARKER MEMORIAL PARK

Branford Yacht Club

BRANFORD POINT

Town Wharf

LAMPHIER COVE

BRANFORD HARBOR

BRANFORD RIVER

PAWSON PARK

INDIAN NECK

INDIAN NECK POINT

DOUBLE BEACH

LOVERS I.

BRANFORD

N°2

JOHNSON POINT

JEFFREY POINT

SEDGE I.

LINDEN POINT

GLAM I.

SUMAC I.

LONG ISLAND SOUND

WIND DIAGRAM FOR NEW HAVEN, CONN.

LEGEND

AVERAGE VELOCITY IN M.P.H.

DURATION IN PERCENT OF TIME

NOTES.

Soundings are in feet, and are referred to the plane of Mean Low Water.

Existing project shown thus:

Desired improvement shown thus:

12-ft. contour shown thus:

BRANFORD HARBOR CONNECTICUT

IN 1 SHEET

SCALE IN FEET

400 0 400 800 1200 1600

U.S. ENGINEER OFFICE, PROVIDENCE, R.I., MAY 15, 1946.

SUBMITTED: PRINCIPAL ENGINEER

APPROVED: COL., CORPS OF ENGINEERS

DRAWN BY: R.M.F.
TRACED BY: R.M.F.
CHECKED BY:

TO ACCOMPANY REVIEW REPORT DATED MAY 31, 1946.

FILE NO. Bd. 62

PLATE 1

NOT FOR PUBLIC RELEASE

WAR DEPARTMENT
UNITED STATES ENGINEER OFFICE
PROVIDENCE 2, RHODE ISLAND

31 May 1946

Subject: Review Report on Branford Harbor, Connecticut.

To: The Division Engineer, New England Division, Boston, Mass.

SYLLABUS

The District Engineer finds that prospective benefits to commercial traffic do not warrant further improvement of Branford Harbor. Prospective benefits to pleasure craft warrant improvement of anchorage facilities, but general benefits are insufficient to justify construction entirely at Federal expense. Since local interests are not prepared to assume the share of the cost warranted by the substantial local benefits, no further improvement of the locality is recommended at this time.

AUTHORITY

1. This report on survey of Branford Harbor, Connecticut is in review of previous reports, and is submitted in compliance with Departmental direction based on the following Resolution adopted October 10, 1945 by the Committee on Commerce of the United States Senate:

> "Resolved by the Committee on Commerce of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report on Branford Harbor, Connecticut contained in House Document Numbered 1292, Sixty-fourth Congress, First Session, and other reports, with a view of determining whether the project should be modified in any way at this time."

NATURE OF REPORTS BEING REVIEWED

2. The report submitted in House Document No. 1292, Sixty-fourth Congress, first session, was of survey scope. It considered the advisability of providing a channel 12 feet deep at mean low water through the inner harbor and river. A breakwater to protect the entrance channel was considered also. The Chief of Engineers reported that no additional improvement of Branford Harbor was advisable at that time and recommended that a depth not exceeding 7.5 feet at mean low water be maintained through

the inner harbor. No change was recommended in the 8.5 foot project depth in the river. Congress has taken no action on this report. Data on other reports under review are included in the subsequent paragraph "Prior Reports."

DESCRIPTION

3. Branford Harbor lies on the north shore of Long Island Sound about 5 miles east of New Haven Harbor. The entrance to the harbor is almost one mile wide. The harbor extends inland about one mile narrowing at the inner end to a width of less than one-half mile. A line between Lovers Island and Indian Neck Point separates the outer and inner harbors. The outer harbor is flat with depths ranging generally from 9 to 14 feet. The inner harbor has depths generally less than 8 feet and is broken by numerous rocky shoals and islands. A dredged channel 8.5 feet deep extends through the inner harbor to Branford Point. The harbor offers good shelter from northerly storms but is exposed to the south.

4. Branford River, a small tidal stream, enters the inner harbor at Branford Point. It is about 500 feet wide at its mouth and thence to the head of navigation at the upper wharf varies from 2000 to 200 feet in width. Natural depths exceeding 10 feet are found in a channel about 60 feet wide in the lower river. An 8.5 foot dredged channel leads through the upper river between the lower and upper wharves.

5. No bridges cross any portion of the improved waterway. The head of the improved channel is situated at a Town highway bridge just above the upper wharf. This bridge was built as a fixed span with provision for conversion to a drawspan. It was constructed in 1938 under plans approved by the Secretary of War. The mean tidal range is 5.9 feet. The locality is shown on United States Coast and Geodetic Chart No. 217 and on Plate 1 (File No. Bd. 62), accompanying this report.

TRIBUTARY AREA

6. The area tributary to the harbor consists of the Town of Branford with a population of about 7,500, a grand list of about $13,000,000

and a net indebtedness of about $300,000. The principal industries are farming, fishing, quarrying and the manufacture of malleable iron products. The service of summer visitors plays an important part in the economic life of the community. Many summer homes are situated on the shores of the harbor. Excellent transportation facilities exist. Good roads prevail throughout the area. The main line of the New York, New Haven and Hartford Railroad passes through Branford. Passenger trains stop infrequently. Bus service to New Haven provides convenient connection with all New York and Boston trains.

PRIOR REPORTS

7. Branford Harbor has been the subject of three survey reports, and also three preliminary examinations which did not result in surveys, all as listed in the following tabulation:

Prior Reports on Branford Harbor

Year	Nature, Portion Considered and Recommendation	Published in
1883	Survey of harbor and river channels, unfavorable.	S. Ex. Doc. No. 50, 48th Cong., 1st sess. A.R.C. of E. 1884, p. 679.
1900	Survey of harbor and river channel and breakwater, favorable to 8.5-foot river channel. Basis of existing project.	H. Doc. No. 100, 56th Cong., 2d sess. A.R.C. of E. 1901, p. 1188.
1907	Preliminary examination of harbor and river channel, unfavorable to 12.5-foot channel.	H. Doc. No. 80, 60th Cong., 1st sess.
1916	Survey of harbor and river channel and breakwater, unfavorable to 12-foot channel.	H. Doc. No. 1292, 64th Cong., 1st sess.
1931	Preliminary examination of harbor and river channel, unfavorable to 12-foot channel.	Not published.
1936	Preliminary report on breakwater and anchorage basin, unfavorable.	Not published.

EXISTING PROJECT

8. There was no Federal improvement prior to the adoption of the existing project in 1902, when a channel 8-1/2 feet deep at mean low water and 100 feet wide in the upper river was authorized. Although no further work had been recommended, the River and Harbor Act approved March 2, 1907 authorized continuation of the channel with the same dimensions "through the shoals at its outer end to deep water in the outer channel". The

existing project thus provides for a channel 8-1/2 feet deep and 100 feet wide from that depth in the outer harbor to the upper wharf in the river. This project was completed in 1907 at a cost of $9,537.45 for new work. Project dimensions were restored in April 1946. The cost of maintenance to April 30, 1946 has been $118,814.88. The approved estimate for annual cost of maintenance is $2,500. This amount will be inadequate if dredging costs continue at their present level. The average annual maintenance cost for the past eight years has been about $5,700. No changes in the existing project have been recommended to Congress.

LOCAL COOPERATION AND OTHER IMPROVEMENTS

9. No conditions of local cooperation have been prescribed by law. The Malleable Iron Fittings Company has expended over $24,000 in periodic dredging of its berth and the adjacent section of the channel in the upper river. A depth of 12 feet at mean low water has been maintained in its berth since 1942. Some widening of the bends in the lower river has been accomplished also. This same company expended $30,000 in 1938 in additions and improvements to its wharfage facilities. The Town of Branford constructed a free public wharf at Branford Point in 1928. The cost of this work is unknown. No other improvements benefitting general navigation have been reported.

TERMINAL AND TRANSFER FACILITIES

10. There are two commercial wharves in the upper river. The largest is owned and operated by the Malleable Iron Fittings Company. It is of solid fill construction with pile and timber apron. It has a total length of 680 feet with depths of 10 to 12 feet alongside. Mechanical handling facilities are available for unloading bulk cargo. The Branford Coal and Lumber Company owns a solid fill wharf about 130 feet long. This wharf was used in the past for the receipt of coal and lumber. Recently it has been used for the shipment of stone from nearby quarries. Both wharves are open to the public at the owner's convenience.

Existing commercial facilities are adequate for existing and prospective commerce.

11. At Branford Point, the Town of Branford maintains a free public wharf. It is 93 feet long of pile and timber construction. Depths alongside average 6 feet. The wharf is used by the Branford Yacht Club, transient pleasure craft and fishing vessels. Several boatyards are situated in the inner harbor and upper river. These yards build, service, repair, and store pleasure craft. Additional winter storage space is needed. Additional facilities are contemplated provided more anchorage space is made available. There are numerous small private piers situated on the shores of the harbor, none of which is open to the public. Ample space is available for construction of additional facilities when required.

IMPROVEMENT DESIRED

12. A public hearing held at Branford, Connecticut on December 13, 1945 was attended by State and Town officials, a representative of a towboat association, businessmen, and officers of the Branford Yacht Club. The Malleable Iron Fittings Company, the principal freight receiver on the river, requested that a channel 12 feet deep at mean low water and 100 feet wide be provided from deep water in Branford Outer Harbor to the present head of navigation. The Branford Yacht Club, representing pleasure boat interests, requested the dredging of an anchorage basin 250 feet wide, about 1200 feet long and 6 feet deep at mean low water adjacent to the town wharf at Branford Point.

13. In justification of the desired 12-foot channel the spokesman for the Malleable Iron Fittings Company stated that substantial transportation savings will accrue to the company if a 12-foot depth is provided. Slight relocation of the existing channel at the upper wharf would provide additional benefits through elimination of the need for frequent dredging alongside the wharf. The spokesman for the towing line discussed the difficulties encountered in traversing the unimproved portion of the river between the project channels of the Inner Harbor and Upper River.

He stated that the natural channel was so narrow in places as to seriously endanger existing traffic.

14. Pleasure-craft interests cited the inconveniences to pleasure boating due to lack of depth in the existing protected anchorage area. It was stated that development of recreational use of Branford Harbor was being hampered thereby. The yacht club spokesman expressed the opinion that an increase in anchorage area would result in immediate increased use of the waterway by pleasure craft.

15. In the matter of local cooperation the Malleable Iron Fittings Company offered to contribute to the project if the upper channel section is moved closer to its wharf. A local boatyard owner offered a spoil-disposal area. It was indicated that other spoil areas would be made available. Town officials indicated that a local cash contribution for construction of the pleasure-craft anchorage might be forthcoming, although no firm offer was made at the hearing. A State official stated that State participation was possible, although no State policy has been formulated yet for cooperation with the towns on navigation projects.

COMMERCE

16. Commerce - Past and Present. - The commerce of Branford Harbor has shown only slight variations in the past 8 years. Prior to the war waterborne coal was received. For 10 years prior to the war waterborne commerce averaged about 12,700 tons annually. Wartime restrictions decreased this average to about 6,000 tons annually for the past 4 years. No shipments have been made since 1939 when 25,000 tons of quarried stone were shipped by barge. The following table shows the tonnages and commodities handled during the past 5 years, all of which were received by Malleable Iron Fittings Company.

Commerce - Branford Harbor, Connecticut
Receipts in short tons

Commodity	1941	1942	1943	1944	1945
Molding sand	4303	4864	4316	4335	4230
Pig iron	1542	526	2232	645	2205
Totals	5845	5390	6548	4980	6435

In addition to the above, a small quantity of fish and shellfish is landed at the town wharf. No data are available on the tonnage involved.

17. Commerce - Prospective. - In addition to the molding sand and pig iron now being received, the principal receiver plans to receive by water about 9,800 tons of bituminous coal and core sand annually if a 12-foot channel is provided through the harbor and river. Whether other commerce would develop is purely conjectural. Petroleum products can be received economically by water, providing adequate storage facilities are developed. The proximity of New Haven Harbor is detrimental to any large petroleum development on the Branford River. Any storage facilities which might be developed would probably be used to store petroleum solely for local consumption. Pleasure-craft interests believe that more anchorage space will attract many additional pleasure craft, both local and transient.

18. Commerce - Estimated Savings. - The company anticipating receipts of coal and core sand expects a transportation savings of 60 cents a ton on 9,800 tons, or $5,880 annually, over the savings now realized on the existing project. Due to the receiver's plant layout, handling charges for waterborne bulk freight are stated to be 25.5 cents a ton less than by rail. For 9,800 tons, savings in handling charges would total about $2,510. In addition a slight realignment of the upper channel reach would eliminate dredging by the Malleable Iron Fittings Company between its wharf and the channel. Savings in maintenance costs of $1,180 annually are indicated if a 12-foot channel is provided alongside its wharf. Thus the estimated benefits this company anticipates through the provision of a 12-foot channel total about $9,570 annually.

19. The present annual business of six local boatyards is reported to total $25,000 annually, but the majority of the boats using the harbor are repaired and stored during the winter months in other harbors. Local interests believe that an enlarged anchorage area adjacent to the town wharf will double this business at the least. Net benefits from such an increase might total about $2,500 annually.

VESSEL TRAFFIC

20. Trips and drafts of vessels carrying the commerce of the harbor for the past 3 years are given in the following tabulation:

Inbound Trips and Drafts of Commercial Vessels

Type	Loaded Draft (feet)	1943	1944	1945
Barge	10 - 12	6	6	8
Barge	9	2	-	-
Motor	9	-	-	1
Motor	7 - 9	-	2	-
Motor	Under 6	1	-	-
Totals		9	8	9

21. In addition to the foregoing commercial traffic, the harbor and river are used by a number of fishing and pleasure craft. The local pleasure-craft fleet numbers about 75 vessels, valued at about $125,000 and assessed for tax purposes at $70,000. During the summer season over 150 visiting craft use the waterway. No record is available of the number of trips made by either pleasure or fishing craft.

DIFFICULTIES ATTENDING NAVIGATION

22. The principal difficulty attending navigation as reported at the public hearing is the lack of width in the natural river channel between the lower and upper improved sections. Lack of depth throughout the channel necessitates tidal operation of barges and towboats. There is insufficient safe anchorage area for the smaller craft which use the harbor.

SURVEY

23. For the purpose of this report a hydrographic survey of the proposed site of the anchorage basin and of prospective spoil areas has been made. This and other data compiled from surveys of the harbor and river made in connection with maintenance dredging operations are shown on the accompanying map, Plate 1 (File No. Bd. 62).

PLAN OF IMPROVEMENT

24. The plan of improvement considered herein follows closely the desires of local interests. It includes a channel through the harbor and river 100 feet wide and 12 feet deep at mean low water for commercial traffic and a pleasure-craft anchorage basin, northeast of the town wharf, 6 feet deep at mean low water, 250 feet wide and about 1,100 feet long. The proposed 12-foot channel is located parallel to and adjoining the berth of the Malleable Iron Fittings Company. The layout of the channel and basin is shown on the accompanying map, Plate 1. The estimated quantities of material to be removed are place measurement and include one foot of allowable overdepth dredging. The estimated costs are based on hydraulic removal and disposal. They are on a current basis and include the cost of engineering and administration.

Estimated Costs of Channel Improvement

Channel 12 feet deep at M.L.W., 100 feet wide from deep water in Branford Outer Harbor to the upper wharf in Branford River.	
Dredging 250,000 cubic yards of mud and sand at 50 cents	$125,000
Estimated annual cost of maintenance, in addition to present costs	4,000

Estimated Cost of Pleasure-Craft Anchorage

Pleasure-craft anchorage, northeast of the town wharf, 6 feet deep at M.L.W., about 6 acres in area.	
Dredging 50,000 cubic yards of mud and sand at 60 cents	30,000
Estimated annual cost of maintenance	1,000

25. The company anticipating benefits from the 12-foot improvement has maintained its berth to a depth of 12 feet since 1942. The latest maintenance dredging accomplished by this company was done in 1946. The Branford Yacht Club proposes to provide additional moorings if the 6-foot

basin is authorized. The cost of these moorings will be self-liquidating through rental charges. Therefore, their cost is not considered as part of the total cost of the project.

AIDS TO NAVIGATION

26. The United States Coast Guard has been consulted. That agency has furnished an estimate of $4,800 first cost and $742 annually for maintenance of the additional navigation aids that would be required in connection with the 12-foot channel. No aids are required for the pleasure-craft anchorage.

ANALYSIS OF ECONOMIC JUSTIFICATION

27. The total annual charges have been computed for the two proposed improvements. Interest and amortization were figured using an interest rate of 3 percent on Federal investment and 3.5 percent on non-Federal funds. A useful life of 50 years has been used for the channel improvement and 25 years for the pleasure-craft anchorage. A local contribution of 50 percent of the initial cost of the pleasure-craft basin has been assumed. Expenditures required and annual charges are summarized in the following tabulation:

Summary of Estimated Costs

Item	Federal	Non-Federal	Total	Maintenance
Estimated Costs of Channel Improvement				
Dredging	$125,000	-	$125,000	$4,000
Navigation Aids	4,800		4,800	742
Total	$129,800		$129,800	$4,742
Estimated Cost of Pleasure-Craft Anchorage				
Dredging	$ 15,000	$15,000	$ 30,000	$1,000

Summary of Estimated Annual Carrying Charges

Item	Federal		Non-Federal	Total
	Interest and Amortization	Maintenance	Interest and Amortization	
Channel	$5,050	$4,742	-	$9,792
Anchorage	900	1,000	$900	2,800

WATER POWER AND OTHER SPECIAL SUBJECTS

28. Questions of water power and flood protection are not pertinent to this report. Prospective use of the harbor as a seaplane base would not be affected adversely by the proposed improvements. The improvements considered will not have an adverse effect on wild life nor result in erosion or accretion to the shores adjacent to the harbor and river. Disposal of dredged material hydraulically will result in the reclamation of some marsh land and make additional waterfront property available for commercial or other use. There are no cultivated oyster beds near enough to the sites of the desired improvements to be affected by dredging operations.

DISCUSSION

29. Branford Harbor and River have been used by commercial vessels for over 60 years. In recent years use of the river has been hampered somewhat by lack of depth in the improved portions of the channel. Gradual decrease in the width of the natural channel in the lower river has been the major difficulty encountered by vessels entering the river. It is reported that towed barges frequently strike the banks of the channel when traversing the bends in the lower river.

30. Local interests request a channel 100 feet wide and 12 feet deep through the harbor and river to the wharf of the Malleable Iron Fittings Company, the principal user of the waterway, to permit receipt of coal in barges drawing up to 11½ feet of water, and to facilitate existing commerce in pig iron and sand. They state that a 12-foot channel through Branford Harbor and River will permit the receipt of 9,800 tons of bituminous coal and additional sand annually at a savings in transportation and handling costs of $8,390. Coal would be transported from Virginia and New Jersey ports in barges drawing 12 to 11½ feet. Sand would be transported from Massachusetts and New Jersey in similar vessels. The Malleable Iron Fittings Company also desires modification in alignment of the last channel reach in the upper river so as to eliminate dredging be-

tween its wharf and the channel. Based on past expenditures for maintaining its vessel berth, savings from such realignment would total about $1,180 annually. Total savings as estimated by the company are about $9,600 annually.

31. The natural channel in the lower river has become too narrow to permit navigation by any but the most experienced towboat operators. Restoration of project width in this portion of the river would eliminate hazards to existing commerce and should be included in future maintenance operations. Potential commerce in coal and sand, for which local interests desire a 12-foot channel, could also be accommodated thereby. Barges drawing 11 feet and less are in common usage in adjacent waterways. They can operate economically in the 8.5-foot channel. Prospective commerce would be attracted by assuring safe transit without fear of grounding. It is certain that widening of the lower river to 100 feet is necessary to encourage receipt of coal. Provision of a 12-foot channel would result either in elimination of tidal delays, if use of 11-foot draft barges is continued, or in use of 12- to 14-foot draft barges in tidal operation.

32. Under present conditions, vessels up to 11-foot draft operate in the waterway. These vessels are generally suitable for the economical transportation of commodities received at Branford. Savings in transportation and handling costs on coal, the principal item of prospective commerce, are stated by proponents to total 85 cents a ton, including savings in handling costs. This large unit saving cannot be obtained. New Haven Harbor, located 7 miles by highway to the west, is the largest coal port in Connecticut. Transportation and handling costs of bituminous coal using deep-draft colliers and barges from Virginia ports to this port, thence truck to Branford, total $4.25 per ton. Similar costs by rail direct to Branford, thence by truck to plant storage total $3.80, while costs by rail to New York, thence barge to Branford total from $3.80 to $4.13 due to the difference in handling costs of

the two kinds of coal used. The Malleable Iron Fittings Company is now receiving coal by truck from New Haven, apparently due to the greater convenience of receipt in truck lots. Therefore no savings can be considered for receipt of coal by water.

33. Local interests state that existing and prospective commerce will total 18,800 tons annually. The average tonnage received at the Malleable Iron Fittings Company during the period 1933 to 1939, when all its coal, sand and pig iron were received by water, was about 14,000 tons, of which about 7,000 tons consisted of bituminous coal. The remainder was divided as follows: pig iron, 2,500 tons; molding sand, 3,500 tons; and core sand, 1,000 tons. The company expects its postwar production to exceed its prewar by about one-third. Therefore, it is assumed that a total of about 18,000 tons of coal, iron and sand will be received annually. As the receipt of coal by water is doubtful, the commerce of the waterway will probably not exceed 9,000 tons annually.

34. Unit savings in transportation costs for pig iron and sand by water over rail have been stated by proponents to be 60 cents a ton. Due to the location of its railroad siding the Malleable Iron Fittings Company finds that handling charges for pig iron transported by rail are about 25 cents a ton more than by water. However, truck delivery from New Haven would eliminate part of this differential. The truck rate for bulk commodities from New Haven to Branford averages 65 cents a ton. Therefore, use of Branford River makes possible a total unit transportation and handling savings of 65 cents a ton on pig iron. The savings on transportation of sand, stated by proponents to be 60 cents a ton, appear reasonable.

35. The annual savings by barge shipment on all commodities, using a unit savings of 65 cents a ton on 3,500 tons of pig iron and 60 cent a ton on 5,500 tons of sand, is about $5,600 for the existing project. For the 12-foot channel these savings are increased by the reduction in maintenance dredging by the Malleable Iron Fittings Company (as the pro-

posed channel adjoins that company's berth), and savings by elimination of tidal delays or use of larger barges. Reduction in maintenance dredging is estimated at $600 annually. Tidal delays average about 3 hours for each trip. Operating cost of an 800-ton barge and towboat has been stated to be about $30 an hour. For existing and reasonably prospective commerce, savings through elimination of tidal delays would total about $1,350 annually based on 15 barge loads, or double this amount if coal is received. A 12-foot channel would entirely eliminate the need for tidal operation for barges up to 11-foot draft. The losses due to tidal delays are insufficient to justify the expenditure necessary for greater depth, as the number of trips made annually is small.

36. Local interests have stated that some channel improvements are needed to permit receipt of coal by water. Therefore, if no improvements are authorized, waterborne commerce will probably be at a rate of about 9,000 tons annually, provided the existing channel project is maintained. Based on the savings computed in the previous paragraph, prospective annual benefits for the 8.5-foot and a 12-foot channel total about $5,600 and $7,550 respectively.

37. The average annual maintenance costs for the existing project for the past 8 years have been about $5,700, not including maintenance of its berth by the Malleable Iron Fittings Company. As the area between the berth and the channel has already been dredged to 12 foot, the 8.5-foot channel could be shifted under the existing project to parallel the berth, thereby reducing the annual maintenance cost by about $600. Therefore, the Federal carrying charges for the existing project are about $5,700 annually, as the small original cost of the improvement is practically liquidated. The carrying charges for the desired 12-foot channel are about $9,800, in addition to the maintenance cost for the existing project.

38. A comparison of reasonably prospective annual benefits and costs for the existing project, and for the 12-foot improvement, as sum-

marized in the following tabulation, indicates that continued maintenance can be justified only by increased traffic and that the further improvement of the locality is not economically justified.

Comparison of Annual Savings with Costs

	Existing Project	12-foot Channel
Federal costs	$5,700	$15,500
Benefits	5,600	7,550
Ratio of Benefits to Costs	1.0	0.5

39. Pleasure-craft Benefits. - Pleasure-craft use of the harbor has been increasing in recent years. All available anchorage space adjacent to the channel suitable for mooring pleasure craft is used by local boats. Cruising boats find it difficult to obtain safe anchorage space. A moderate expansion of existing facilities would provide space for these cruising craft, as well as making space available for further growth of the local fleet. These facilities are needed to eliminate anchoring in the channel, as some traffic will continue to use the river, even if the present project is not maintained. Boat owners in the New Haven metropolitan area seek mooring space in adjacent communities. Branford is ideally situated to serve these interests.

40. Local interests have stated that benefits to local boatyards will total about $2,500 annually. They refer to boatyards situated in Branford. Other yards situated in adjacent towns will benefit also. In addition dealers in food, hardware and other supplies will benefit from improvement of pleasure-craft facilities. Some benefits will accrue also to fishing vessels. The foregoing monetary estimate of local benefits is believed conservative.

41. General benefits, which will result from an improvement of pleasure-craft facilities, are more intangible but no less real than local benefits. Increasing use of the harbor for refuge and other purposes by visiting craft justifies participation in the improvement by the

United States. Increased use of the harbor will also stimulate the entire pleasure-craft industry with consequent widespread benefits. While the general benefits cannot be evaluated accurately, they are considered to be approximately equal to local benefits. Local and general benefits warrant a project having carrying charges of about $5,000. The desired improvement, with annual carrying charges of $2,800 is amply justified, the ratio of benefits to costs being 1.8 to 1.

42. Although combined general and local benefits are sufficient to justify the anchorage improvement, general benefits are insufficient to warrant construction entirely at Federal expense. The substantial benefits to the locality make it equitable to require local cash cooperation in amount of one-half the initial cost, as well as suitable spoil-disposal areas. The provision of suitable spoil-disposal areas is reasonably assured. Although the State would probably join the town in providing necessary funds, the Selectmen of Branford do not feel that development of the harbor is of sufficient importance to warrant contribution by the town at this time. As general benefits warrant only limited Federal participation, no project for further improvement of Branford Harbor for pleasure-craft navigation should be authorized at present.

CONCLUSIONS

43. Existing and reasonably prospective commercial use of Branford River and Harbor does not warrant further improvement by the Federal Government. Project dimensions were restored in April 1946. Annual savings on prospective commerce approximate prospective maintenance costs, therefore continued maintenance of the existing project should be contingent upon future utilization of the channel.

44. The minimum requirements of pleasure-craft navigation are inadequately met by existing mooring facilities. The anchorage considered, which would provide an area of about 6 acres, is needed to meet the needs of the local fleet and the large number of cruising craft which now seek refuge in Branford River channel. Its construction is justified

by prospective benefits, but as these benefits are largely local in character, local interests should contribute about one-half the initial cost of this anchorage, in addition to furnishing suitable spoil-disposal areas. Since assurance of such cooperation is not forthcoming, authorization of a pleasure-craft anchorage should be deferred until satisfactory local cooperation is assured.

RECOMMENDATION

45. No modification of the existing project for Branford Harbor is recommended at this time.

T. F. KERN
Colonel, Corps of Engineers
District Engineer

4 Inclosures:
#1 - Record of hearing, in triplicate
#2 - Check Sheet and Project Analysis Sheet, in trip.
#3 - Prints Bd. 63, in triplicate
#4 - Tracing of Bd. 62, (under separate cover)